ATTACHMENT A

Project 001 - Additional Marking to Meet Prescription

End result is to mark leave trees with orange non-tracer paint to the stocking level and/or other *desired condition* as summarized within the DxPre Table. Designated leave trees shall be marked with (non-tracer) orange paint to Forest Service specifications. All trees greater than 21 inches DBH shall be marked and left standing. Paint is to be supplied by the contractor at their expense. Sufficient quantities of orange paint should be purchased by the contractor to assure color consistency on all treatment units. Black paint is to be used when the contractor adjusts or changes a tree designation to make all orange paint not visible. The Contract Administrator will review and approve the marking prior to harvest.

DxPre Subdivisions (791 acres):
39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 76, 77, 78, 79, 83, 84, 85, 86, 88, 89, 90.

Marking Specifications
The contractor shall mark the entire subdivision. Partial marking of subdivisions is not permitted.

Leave Tree Guidelines:
Abbreviations: TPA (trees per acre), PP (ponderosa pine), WL (western larch), DF (Douglas-fir), WP (western white pine), RC (western red cedar), ES (Engelmann spruce), GF (grand fir), WH (western hemlock), AF (alpine fir), LP (lodgepole pine), QA (quaking aspen), and PB (paper birch).

I. **Leave Tree Marking:**
   - A. The **stump mark** shall be a minimum size of 6 inches long and 2 inches wide. It shall be placed on the downhill side at the base of every leave tree, placed in crevices, and extend onto the forest floor.
   - B. A horizontal **band** at least 2" wide must encircle the tree between 5' and 7' above the ground.
   - C. Paint marks shall be visible for a distance of at least 25' in all directions until harvest operations are complete.
   - D. Leave tree marking applies to conifer trees $\geq$ 5.0" dbh. Hardwood trees shall not be marked.

II. Leave Trees to Mark:
   - A. ALL live trees having a dbh $\geq$ 21.0", or a stump diameter of 26.0" inches when measured at 4 inches above the ground on the high side of the stump.
   - B. ALL live trees of the species designated as "leave all" within Column 3 of the DxPre Table.
   - C. ALL trees that have a tin can, glass jar, plastic jar, or a single pink ribbon wrapped around or on the bole of a tree.
   - D. To meet the Stocking Level (Section IV, Col. 5), first leave trees defined as Most Desirable (C1) followed by Less Desirable (C2). All mandatory leave trees, and hardwood trees, count toward the Stocking Level. See Section III for a description of conditions where the Stocking Level does not apply.

C1. Most Desirable Leave Trees/Suitable: Trees that possess the following characteristics shall be the first choice for desirable leave trees:

a. *Dominant and Co-dominant* Preferred Species: These trees are taller on the average when compared to other trees in the unit that are in the *intermediate* and *suppressed* crown classes. The Preferred Species are in order of preference PP, WL, WP, DF and RC. RC and DF are not a preferred species in areas *dominated by PP*. When the preferred species does not possess desirable tree characteristics, *vigor/growth* is given preference.
b. Health: With the exception of WL and WP, foliage shall be dark green in color. The crown shall cover one third or more of the tree all the way around it. Healthy trees are free of *severe insect or disease problems* and are not stressed. Use Figure B-1 to help assess crown health.
c. Free of Physical Damage: Trees shall not have physical damage from fire, animals or weather on more than one-fourth of the circumference of the bole or more than three feet of length of the bole.
d. Up to 5 Wildlife Trees per acre having a dbh $\geq$ 16.0": Wildlife trees are greater than 40% cull due to heart rot, broken tops, dead tops, forks, and/or bird holes.

C2. Less Desirable Leave Trees (also suitable): When the average basal area of most desirable leave trees cannot be achieved with trees that possess the most desirable characteristics, select trees with less desirable characteristics in the priority listed below:

a. Minor Defect: Preferred species with minor defect such as a minor crook, a small amount of animal damage, or mistletoe < *Hawksworth rating* 3.
b. Dominant and co-dominant ES, WH, & GF (in order of preference) having desirable tree characteristics.
c. Other Live Trees: Trees other than insect or disease damaged trees with at least 30% *live crown ratio* and *height to diameter ratio* $\leq$ 1:100. Species preference for Other Live Trees in order of preference is PP, WL, WP, DF, RC, ES, WH, GF, AF, LP.
d. Physical Damage: Trees that have physical damage on less than half the bole circumference and less than three feet in length. Physical damage may be caused by equipment, falling trees, lightning, wind, animals, etc.

III. Stocking Level: Areas Where the Stocking Level does not Apply

A. The Stocking Level does not apply to Gaps (described in section V, A, B, and C).
B. The Stocking Level does not apply to areas with *natural low stocking*.
C. The Stocking Level does not apply to areas with *abundant* trees specified as "Do not leave" in Col. 3 of the DxPre Table.
D. All suitable trees shall be retained within areas of natural low stocking and areas with abundant trees specified as "Do not leave" in Col. 3 of the DxPre Table.

IV. Stocking Level: Areas Where the Stocking Level Applies

A. The Stocking Level applies to all areas, except as described in Section III.
B. Mandatory leave trees (Section II, A, B) and hardwood trees count toward the Stocking Level.
C. The average Stocking Level specified in the DxPre Table shall be within the range specified.

D. For units showing a range in Stocking Level in Col. 5 of the DxPre Table (example 60-80 ft^2 BA/ac), leave the high end of the Stocking Level when there are enough available Most Desirable Trees (C1) to meet the high end of the range and graduate to the low end of the Stocking Level as more of the leave basal area is made of Less Desirable Leave Trees (C2).
E. The density may vary by up to 50% to allow for the selection of the Most Desirable trees; this is acceptable providing that the Most Desirable trees are retained and the average Stocking Level is met. For example, where the Stocking Level is 60-80 ft^2 BA/ac, the density may vary between 30-120 ft^2 BA/ac as applicable.
F. In areas with mandatory leave trees (described in Section II., A, B), the Stocking Level may be higher than the variance provided in Section IV, E. These areas shall count towards the Stocking Level target.

V. Gaps: Do Not Mark leave trees described in A-C below: These are unsuitable trees. However, an exception shall be made for mandatory leave trees (II. A, B) and as specified in B and C below.

A. Yellow-paint gap: All live conifer trees within 50 feet (±10%) of trees marked with yellow paint as specified in Col. 4 of the DxPre Table.
B. Large PP gap: All live conifer trees, except Most Desirable PP/WL, within the distance (±10%) of *large PP* as specified in Col. 4 of the DxPre Table.
C. Aspen and/or Birch gap: All live conifer trees, except Most Desirable PP/WL, within the distance (±10%) of *Aspen clones or Birch clumps* specified in Col. 4 of the DxPre Table.

Designation by Prescription (DxPre) Table

Subdivision No. (Col 1)	**Acres** (Col 2)	**Specifications** see Section II, B (Col 3)	**Gaps** see Section V (Col 4)	**Stocking Level** see Section IV (Col 5)
All	All	All trees ≥21.0 inches DBH, 26.0 inches stump diameter, shall be left standing.	All trees with yellow paint shall be left standing.	Section III describes conditions where the stocking level does not apply. Follow the tree selection criteria in Section II.
39	17	Species designation: Leave all WL / PP	Yellow paint	70-90 ft^2 BA/ac.
40	29	Species designation: Leave all WL / PP	Yellow paint	70-90 ft^2 BA/ac..
41	36	Species designation: Leave all WL / PP	Yellow paint	70-90 ft^2 BA/ac.
42	21	N/A	N/A	70-80 ft^2 BA/ac.
43	12	N/A	N/A	70-80 ft^2 BA/ac.
44	50	N/A	N/A	50-60 ft^2 BA/ac.
45	50	N/A	N/A	50-60 ft^2 BA/ac.
46	19	Species designation: Leave all RC	N/A	50 ft^2 BA/ac. (+-10%)
47	22	Species designation: Leave all PP	Yellow paint	50-60 ft2 BA/ac.
48	55	Species designation: Leave all WL / PP Do not leave LP	N/A	60 ft^2 BA/ac.
49	15	Species designation: Leave all WL	Aspen - 100 feet	70-80 ft^2 BA/ac.
76	48	N/A	N/A	60-80 ft^2 BA/ac.
77	16	Species designation: Leave all PP	N/A	60-90 ft^2 BA/ac.
78	12	Species designation: Leave all PP	N/A	60-80 ft^2 BA/ac.
79	55	Species designation: Leave all WP	N/A	70-90 ft^2 BA/ac.
83	154	N/A	Aspen/birch - 30 feet Yellow paint	60-90 ft^2 BA/ac.
84	65	N/A	Aspen/birch - 30 feet Yellow paint	50-90 ft^2 BA/ac.
85	13	N/A	Aspen/birch - 30 feet Yellow paint	50-90 ft^2 BA/ac.
86	10	N/A	Yellow paint	70 ft^2 BA/ac. (+-10%)

Subdivision No. (Col 1)	**Acres** (Col 2)	**Specifications** see Section II, B (Col 3)	**Gaps** see Section V (Col 4)	**Stocking Level** see Section IV (Col 5)
88	69	N/A	Yellow paint	70 ft^2 BA/ac. (+- 10%)
89	7	Do not leave LP	N/A	40 ft^2 BA/ac. (+- 10%)
90	16	Do not leave LP	N/A	40 ft^2 BA/ac. (+- 10%)

Unit Comments	
Unit 84	One third of leave trees should be RC, where available.
Unit 86	To the extent practicable, leave an average of one clump/acre that includes 9-12 trees.
Unit 88	To the extent practicable, leave an average of one clump/ac. that includes 9-12 trees.
Unit 89	Note that this unit will be planted after harvest. Look for opportunities leave clumps of 2-4 trees as this will help light reach planted seedlings.
Unit 90	Note that this unit will be planted after harvest. Look for opportunities to leave clumps of 2-4 trees as this will help light reach planted seedlings.

Definitions

Abundant: Where cutting all of the conifer species designated as "do not leave" would result in a Stocking Level below the specified level in Col. 5 of the DxPre Table even without harvesting any other trees.

Aspen Clone: Three (3) or more live aspen trees greater than 5.0 inches DBH with boles that are within 15 feet of each other.

Basal Area: The cross-sectional (sq ft) area of trees measured at DBH.

Birch Clump: Three (3) or more live birch trees greater than 5.0 inches DBH with boles that are within 15 feet of each other.

Clumps: two or more leave trees with boles within 15' of one another.

Crown Classes:

- **Codominant** a tree whose crown helps to form the general level of the main canopy in even-aged stands or, in uneven-aged stands, the main canopy of the tree's immediate neighbors, receiving full light from above and comparatively little from the sides.
- **Dominant** a tree whose crown extends above the general level of the main canopy of even-aged stands or, in uneven-aged stands, above the crowns of the tree's immediate neighbors and receiving full light from above and partial light from the sides.

- **Intermediate** a tree whose crown extends into the lower portion of the main canopy of even-aged stands or, in uneven-aged stands, into the lower portion of the canopy formed by the tree's immediate neighbors, but shorter in height than the codominants and receiving little direct light from above and none from the sides.
- **Suppressed** (overtopped) a tree whose crown is completely overtopped by the crowns of one or more neighboring trees – note the vigor of overtopped (suppressed) trees varies from high to low depending on individual circumstances.

Dominated by Ponderosa Pine: areas where over 50% of the basal area is in ponderosa pine.

Hawksworth Mistletoe Rating: Divide the crown of the tree into 3 sections. Rate each section for presence of mistletoe. The sum of the sections equals the Hawksworth Mistletoe Rating. Figure B-2 provides an example.

Height to Diameter Ratio: The relationship between dbh and height. Trees that are overly tall for their diameter size generally have a poor height to diameter ratio. These trees usually bend over once nearby trees have been removed. A 50' height and 6" dbh is 100:1 ratio.

Large PP: large ponderosa pine are trees over 21.0" dbh.

Live Crown Ratio: the ratio of crown length to total tree length.

Natural Low Stocking: areas within a unit that prior to harvest have less than the Stocking Level (DxPre Table Col 5) due to poor site conditions (e.g. rocky soil, brush) or insect- and/or disease-related mortality.

Severe insect or disease problems:

- **Dwarf mistletoe** - Trees with dwarf mistletoe in more than half the crown Hawksworth rating 3 or greater). Brooms, cankers, and swellings on stems and branches are indicators of mistletoe. Mistletoe is common in western larch and Douglas-fir. Epicormic branches are not to be confused with dwarf mistletoe.
- **Root disease** - Trees showing symptoms of root disease should be removed. Frequently, these trees are Douglas-fir near root disease centers (an area of dead, broken off trees). Indicators of root disease include a white fungus growing between the bark and the wood, resin flow at the base of the tree and/or a lighter color crown with fewer needles, (when compared to other Douglas-fir in the area) and fading crowns and/or sap flow from the bole of Douglas-fir, grand fir, and alpine fir.
- **Blister rust** - Symptoms of blister rust include heavy resin flow on the stem from a diamond shaped wound, dead branches and/or a dead top. Blister Rust is common in western white pine.

Vigor/Growth: Relative health and growth of forest trees. Leave-tree preference shall favor trees possessing relatively high vigor/growth, free of disease and defect over trees with relatively poor vigor and growth, regardless of specie preference. For example, a RC with a relatively healthy crown will be favored over and a similarly-sized DF with an unhealthy crown (i.e. faded, yellowing). If the two trees possessed similar vigor/growth characteristics, the DF shall be the preferred leave tree.

Figure B-1. Artwork by Robert Van Pelt 2008. Provided as an example only.

	DESIRABLE LEAVE TREES	UNHEALTHY TREES
Ponderosa pine		
Western larch		
Douglas-fir		
NOTE: use this artwork along with other characteristics as an aid to judge vigor and crown health. Artwork not available for other species.		

Figure B-2. Hawksworth dwarf mistletoe rating system.

Instructions

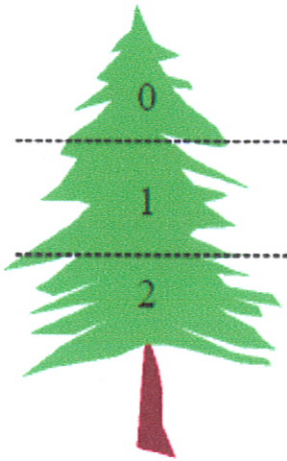
STEP 1. Divide live crown into thirds.

STEP 2. Rate each third separately. Each third should be given a rating of 0, 1 or 2 as described below.

(0) No visible infections.
(1) Light infection (1/2 or less of total number of branches in the third infected).
(2) Heavy infection (more than ½ of total number of branches in the third infected).

STEP 3. Finally, add ratings of thirds to obtain rating for total tree.

Example



If this third has no visible infections, it's rating is (0)

If this third is lightly infected, it's rating is (1)

If this third is heavily infected, it's rating is (2)

The tree in this example will receive A rating of 0+1+2=3.

Project Number 002 - Mechanical Mastication Understory Thinning

The end result of treatment is to reduce ladder fuels and increase tree vigor to develop sustainable forest stands. The Contract Area Map identifies the locations for understory thinning treatments.

Understory thinning treatments are to be completed post-harvest through mechanical mastication.

1. Understory Thinning Treatments: Mechanical Mastication units.
   Acres: 556
   Subdivisions: 39, 40, 41, 46, 76, 77, 78, 79, 83, 84, 85, 88, 89, 90

Specific requirements:

1. Residual conifer regeneration averaging 90 trees per acre (TPA). This average TPA may be achieved through 22 x 22 foot spacing. Spacing may vary by up to 50% to allow for the selection of desirable leave trees provided that the average TPA is met and the low end of the spacing variance is not applied uniformly.
2. Conifer regeneration is defined as trees between 1 foot in height and a DBH less than 7.0 inches.
3. Desirable leave trees possess good growth and vigor, using the following species preference when applicable: ponderosa pine, western larch, Douglas-fir, western red cedar.
4. Retain existing levels of down logs greater than 3" diameter and snags.
5. Cut all conifer regeneration, except for western white pine, within 50' (± 5 feet) of aspen clone.
6. Slash created from understory thinning treatments will be discontinuous with a fuel bed height less than 2 feet above the ground including natural obstacles, while avoiding heavy accumulations adjacent to residual leave trees.

Direction common to all units:

1. Retain all aspen, cottonwood, and western white pine.
2. No designated leave trees will be cut.
3. Equipment will be allowed one pass across units.
4. Trees showing signs of disease, insect attack or mechanical damage are higher priority for removal regardless of species.
5. In root disease pockets, favor species that are more resistant, i.e. western larch, ponderosa pine, western redcedar.
6. Conifer regeneration selected for cutting will not have stumps exceeding 6 inches and will be cut below the lowest live limb.
7. Where overstory trees are infected with mistletoe, no leave trees of the infected species shall be selected within a 50-foot radius(± 5 feet) of the infection source if there are other acceptable disease-free tree species available.

Mandatory Stewardship Project 003 - Culvert Replacement

The end result is to replace 2 undersized culverts on Fisher Creek with bottomless arch culverts that can pass aquatic organisms.

Specifications:
All improvements shall be done in accordance with **Attachment B** and consist of diversion of the streams, removal of the existing culverts, installation of the arches, reshaping of the stream channel, installation of rock stream structures, embankment and excavation of roadway approaches, placement of riprap, and road surfacing.

The *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03)*, 2003, U.S. Department of Transportation, Federal Highway Administration, are included by reference (see web address below). The requirements contained in these specifications are hereby made a part of this solicitation and any resultant contract.

Forest Service Supplemental Specifications (FSSS) for FP-03 contained in **Attachment B** are also applicable to this contract.

Drawings:

The listed drawings contained in **Attachment B** are part of this solicitation and any resultant contract.

Sheet	Description
1	Title, Drawing Index, and Vicinity Map
2	Site Map and Traffic Control Plan
3	Lower Fisher Creek Survey Control, Demo, and Quantities
4	Lower Fisher Creek Culvert Plan and Profile
5	Lower Fisher Creek Road Plan and Profile
6	Lower Fisher Creek Details
7	Upper Fisher Creek Survey Control, Demo, and Quantities
8	Upper Fisher Creek Culvert Plan and Profile
9	Upper Fisher Creek Road Plan and Profile
10	Upper Fisher Creek Details
11	Sample Dewater Plan

Other Requirements:

All instream work shall be completed between June 16 and September 30.